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EXAMINER

CHOI, WILLIAM C

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 07/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/711,651

Applicant(s)

NITO ET AL.

Examiner

William C. Choi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-8, 10, 13-15, 19, 74-86, 111-113, 115, 118-120, 124 and 150-164 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-8, 10, 13-15, 19, 80-82, 111-113, 115, 118-120, 124, 155-158, 163 and 164 is/are allowed.
- 6) ☒ Claim(s) 74-76, 83, 86, 150-152, 159 and 162 is/are rejected.
- 7) ☒ Claim(s) 77-79, 84, 85, 153, 154, 160 and 161 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 74-86 and 150-162 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 74-76, 86, 150-152 and 162 are rejected under 35 U.S.C. 102(e) as being anticipated by Furukawa et al (U.S. 6,411,576 B1).

In regards to claims 74-76 and 86, Furukawa et al discloses an optical pickup apparatus (column 2, lines 39-44 and column 5, line 33, Figure 2, "13") comprising: a

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light modulation apparatus including a liquid crystal device (column 5, line 42, Figure 2, "10"), a drive pulse generation unit for driving said liquid crystal device (column 5, lines 56-58, Figure 2, "27"- "29"), and a pulse width control unit for modulating a pulse width of each drive pulse to be applied to said liquid crystal device (column 5, lines 57-58), thereby inherently controlling a transmittance of light made incident on said liquid crystal device, this being reasonably assumed from Furukawa et al disclosing said liquid crystal device introducing a phase difference to the light beam to compensate for wavefront aberration (column 5, line 65 – column 6, line 1); wherein said light modulation apparatus (Figure 2, "10") is disposed in an optical path (column 5, line 36, Figure 2, "B") of an optical system of said optical pickup apparatus (Figure 2, "13").

Specifically further in regards to claim 74, the pulse width of each drive pulse would inherently be modulated with its pulse height kept constant, this being reasonably assumed from Furukawa et al disclosing only a pulse "width" modulation circuit (column 5, lines 57-58).

Specifically further in regards to claim 75, an average per unit time of positive and negative pulse heights of drive pulses applied between drive electrodes of said liquid crystal device upon modulation of the pulse width of each drive pulse would inherently be zero, this being reasonably assumed from this condition being satisfied from the arbitrary placement of the zero reference line on the drive pulse waveform.

Specifically further in regards to claim 76, the modulation of the pulse width of each drive pulse would inherently be performed in such a manner that the waveform of each drive pulse is present in a period of basic frequency, this being reasonably

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assumed from Furukawa et al disclosing the drive pulses (Figures 5A-5C, "Sdv1" – "Sdv3") having phase differences compared to a reference voltage (column 8, lines 51-61, Figures 5A-5C, "REF. VOLTAGE"), which is indicative of a periodic frequency.

Specifically further in regards to claim 86, Furukawa et al further discloses wherein a drive electrode of said liquid crystal device is formed at least over the entire region of an effective light transmission portion (column 8, lines 7-26, Figure 4B, "10c").

In regards to claims 150-152 and 162, Furukawa et al discloses a method of driving an image pickup apparatus in which a liquid crystal device (column 5, line 42, Figure 2, "10") is disposed in an optical path (column 5, line 36, Figure 2, "B") of an optical system of said optical pickup apparatus (column 2, lines 39-44 and column 5, line 33, Figure 2, "13"), comprising the step of: modulating a pulse width of each drive pulse to be applied to said liquid crystal device (column 5, lines 57-58), thereby inherently controlling a transmittance of light made incident on said liquid crystal device.

Specifically further in regards to claim 150, the pulse width of each drive pulse would inherently be modulated with its pulse height kept constant, this being reasonably assumed from Furukawa et al disclosing only a pulse "width" modulation circuit (column 5, lines 57-58).

Specifically further in regards to claim 151, an average per unit time of positive and negative pulse heights of drive pulses applied between drive electrodes of said liquid crystal device upon modulation of the pulse width of each drive pulse would inherently be zero, this being reasonably assumed from this condition being satisfied from the arbitrary placement of the zero reference line on the drive pulse waveform.

Specifically further in regards to claim 152, the modulation of the pulse width of each drive pulse would inherently be performed in such a manner that the waveform of each drive pulse is present in a period of basic frequency, this being reasonably assumed from Furukawa et al disclosing the drive pulses (Figures 5A-5C, "Sdv1" – "Sdv3") having phase differences compared to a reference voltage (column 8, lines 51-61, Figures 5A-5C, "REF. VOLTAGE"), which is indicative of a periodic frequency.

Specifically further in regards to claim 162, Furukawa et al further discloses wherein a drive electrode of said liquid crystal device is formed at least over the entire region of an effective light transmission portion (column 8, lines 7-26, Figure 4B, "10c").

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 83 and 159 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al and further in view of Saimi et al (U.S. 6,430,137 B1).

In regards to claim 83, Furukawa discloses an optical pickup apparatus (column 2, lines 39-44 and column 5, line 33, Figure 2, "13") comprising: a light modulation apparatus including a liquid crystal device (column 5, line 42, Figure 2, "10"), a drive pulse generation unit for driving said liquid crystal device (column 5, lines 56-58, Figure 2, "27"-"29"), and a pulse width control unit for modulating a pulse width of each drive

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pulse to be applied to said liquid crystal device (column 5, lines 57-58), thereby inherently controlling a transmittance of light made incident on said liquid crystal device, this being reasonably assumed from Furukawa et al disclosing said liquid crystal device introducing a phase difference to the light beam to compensate for wavefront aberration (column 5, line 65 – column 6, line 1); wherein said light modulation apparatus (Figure 2, "10") is disposed in an optical path (column 5, line 36, Figure 2, "B") of an optical system of said optical pickup apparatus (Figure 2, "13"), but does not specifically disclose a polarizing plate disposed in an optical path of light made incident on said liquid crystal device. Within the same field of endeavor, Saimi et al teaches that it is desirable to have a polarizing plate as claimed, in a liquid crystal image pickup device for the purpose of increasing the utilization efficiency for the light beam irradiated onto photo-detectors and obtaining an aberration detection with a high S/N ratio (column 16, lines 53-57, Figure 16, "115").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for a polarizing plate to be disposed in an optical path of light made incident on said liquid crystal device since Saimi et al teaches that it is desirable to have a polarizing plate as claimed, in a liquid crystal image pickup device for the purpose of increasing the utilization efficiency for the light beam irradiated onto photo-detectors and obtaining an aberration detection with a high S/N ratio.

In regards to claim 159, Furukawa et al discloses a method of driving an image pickup apparatus in which a liquid crystal device (column 5, line 42, Figure 2, "10") is disposed in an optical path (column 5, line 36, Figure 2, "B") of an optical system of said

optical pickup apparatus (column 2, lines 39-44 and column 5, line 33, Figure 2, "13"), comprising the step of: modulating a pulse width of each drive pulse to be applied to said liquid crystal device (column 5, lines 57-58), thereby inherently controlling a transmittance of light made incident on said liquid crystal device, but does not specifically disclose a polarizing plate disposed in an optical path of light made incident on said liquid crystal device. Within the same field of endeavor, Saimi et al teaches that it is desirable to have a polarizing plate as claimed, in a liquid crystal image pickup device for the purpose of increasing the utilization efficiency for the light beam irradiated onto photo-detectors and obtaining an aberration detection with a high S/N ratio (column 16, lines 53-57, Figure 16, "115").

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for a polarizing plate to be disposed in an optical path of light made incident on said liquid crystal device since Saimi et al teaches that it is desirable to have a polarizing plate as claimed, in a liquid crystal image pickup device for the purpose of increasing the utilization efficiency for the light beam irradiated onto photo-detectors and obtaining an aberration detection with a high S/N ratio.

Allowable Subject Matter

Claims 6-8, 10, 13-15, 19, 80-82, 111-113, 115, 118-120, 124, 155-158, 163 and 164 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented

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in claims 6-8, 10, 13-15 and 19: a light modulation apparatus as claimed specifically wherein luminance information of light emerged from the liquid crystal device is fed back to the control circuit unit, and the pulse width of each drive pulse is modulated in synchronization with a clock generated by said drive circuit unit on the basis of a control signal supplied from said control circuit unit.

The prior art fails to teach a combination of all the claimed features as presented in claims 80-82: an image pickup apparatus as claimed specifically wherein said liquid crystal device is a guest-host type liquid crystal device.

The prior art fails to teach a combination of all the claimed features as presented in independent claim 111-113, 115, 118-120 and 124: a method of driving a light modulation apparatus including a liquid crystal device as claimed specifically wherein luminance information of light emerged from the liquid crystal device is fed back to the control circuit unit, and the pulse width of each drive pulse is modulated in synchronization with a clock generated by said drive circuit unit on the basis of a control signal supplied from said control circuit unit.

The prior art fails to teach a combination of all the claimed features as presented in claim 155: a method of driving an image pickup apparatus as claimed specifically wherein the pulse width of each drive pulse is modulated in synchronization with a clock generated by a drive circuit unit on the basis of a control signal supplied from a control circuit unit.

The prior art fails to teach a combination of all the claimed features as presented in claims 156-158: a method of driving an image pickup apparatus as claimed specifically wherein said liquid crystal device is a guest-host type liquid crystal device.

The prior art fails to teach a combination of all the claimed features as presented in claim 163: a light modulation apparatus as claimed specifically comprising a polarizing plate that is disposed in a movable portion of a mechanical iris in a manner whereby it is movable in or from the optical path by operation of said movable portion of said mechanical iris.

The prior art fails to teach a combination of all the claimed features as presented in claim 164: a method of driving a light modulation apparatus as claimed specifically wherein a polarizing plate is disposed in a movable portion of a mechanical iris in a manner whereby it is movable in or from the optical path by operation of said movable portion of said mechanical iris.

Claims 77-79, 84, 85, 153, 154, 160 and 161 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claims 77 and 79: an image pickup apparatus as claimed specifically wherein the basic frequency and the modulated pulse width are adjusted in such a manner as to prevent the occurrence of flicker in stationary drive of said light modulation apparatus.

The prior art fails to teach a combination of all the claimed features as presented in claim 78: an image pickup apparatus as claimed specifically wherein each drive pulse is generated in synchronization with a clock generated by said drive circuit unit.

The prior art fails to teach a combination of all the claimed features as presented in claims 84 and 85: an image pickup apparatus as claimed specifically wherein said polarizing plate is movable in or from the optical path.

The prior art fails to teach a combination of all the claimed features as presented in claim 153: a method of driving an image pickup apparatus as claimed specifically wherein the basic frequency and the modulated pulse width are adjusted in such a manner as to prevent the occurrence of flicker in stationary drive of said light modulation apparatus.

The prior art fails to teach a combination of all the claimed features as presented in claim 154: a method of driving an image pickup apparatus as claimed specifically wherein each drive pulse is generated in synchronization with a clock generated by said drive circuit unit.

The prior art fails to teach a combination of all the claimed features as presented in claims 160 and 161: a method of driving an image pickup apparatus as claimed specifically wherein said polarizing plate is movable in or from the optical path.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (703) 305-

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3100. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (703) 308-4883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

W.C.
William Choi
Patent Examiner
Art Unit 2873
June 30, 2003


Georgia Epps
Supervisory Patent Examiner
Technology Center 2800